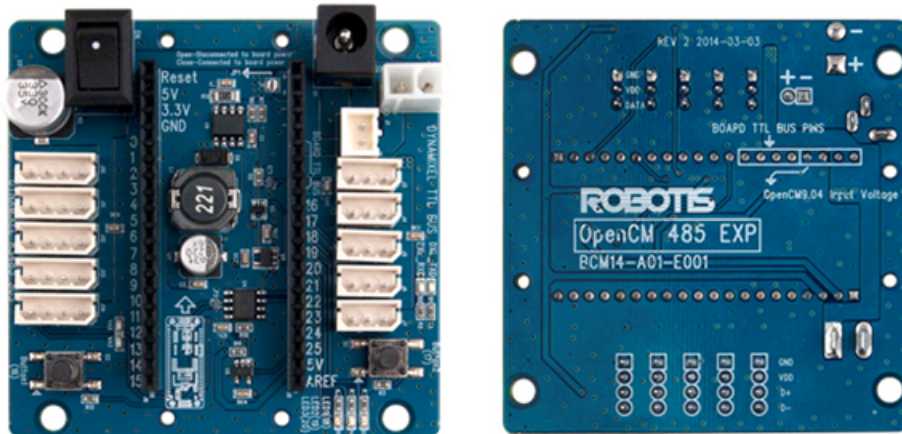


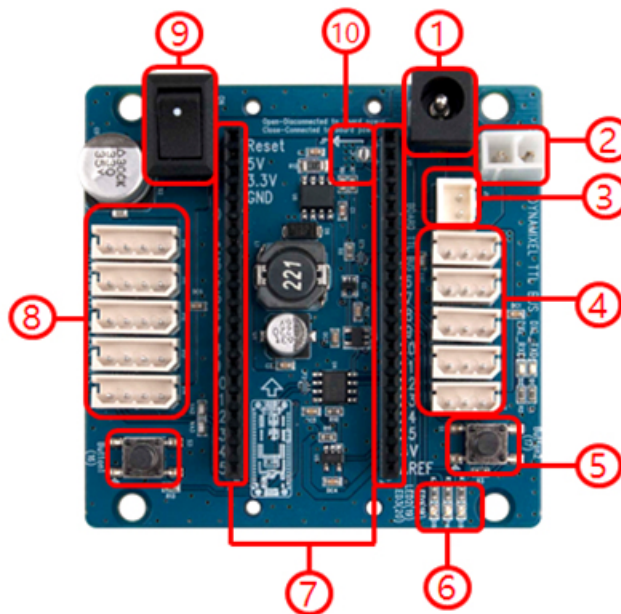
OpenCM 485 EXP

Product Image



[OpenCM 485 EXP]

Components

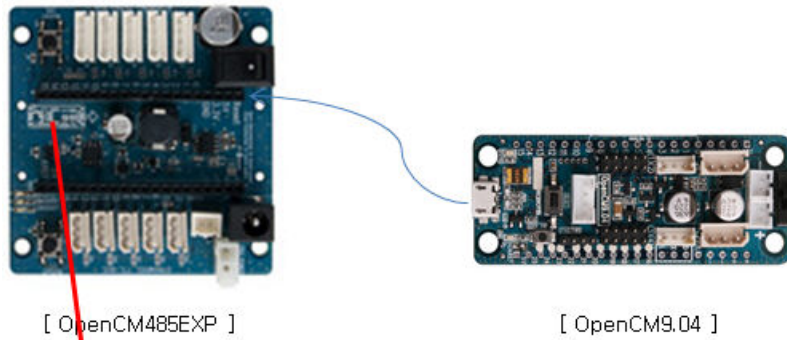


[OpenCM 485
EXP Components]

1. **SMPS DC Connector** : For using SMPS DC Adapter to supply power to OpenCM 485 EXP board.
2. **DXL Pro Power Connector** : Power connector for Dynamixel Pro (24V).
3. **Li-Po battery Connector** : Connector for 11.1V Li-Po battery(LBS-10).
4. **Dynamixel TTL 3 -Pin Bus** : Used to connect 3-Pin Cables(Dynamixel TTL Bus) and for daisy chaining Dynamixels.
5. **User Button** : Function of these buttons can be assigned by the user.
6. **User LED** : LED that can be controlled by the user.
7. **I/O header** : Header pins used to mount OpenCM9.04(2.54mm pitch).
8. **Dynamixel 485 4-Pin Bus** : Used to connect 4-Pin Cables(Dynamixel TTL Bus) and for daisy chaining Dynamixels.
9. **Power Switch** : Switch that powers the board and Dynamixel. Note: Does not disconnect the power received via USB cable.
10. **JP1 Jumper** : Jumper that determines whether the power inputted onto OpenCM 485 EXP will be supplied to OpenCM9.04 board or not.

Connecting OpenCM 485 Expansion Board and OpenCM9.04

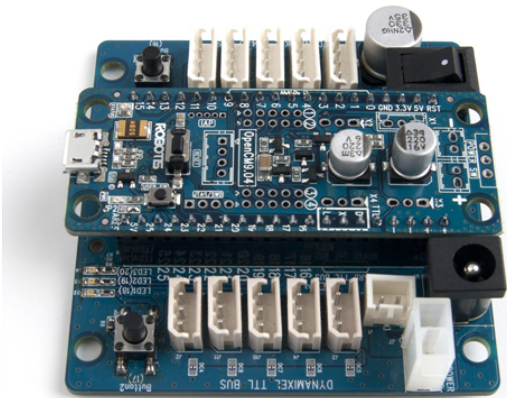
1. Prepare OpenCM 485 EXP and OpenCM9.04 boards. Any version of OpenCM9.04 is compatible. Solder the header onto the OpenCM9.04.



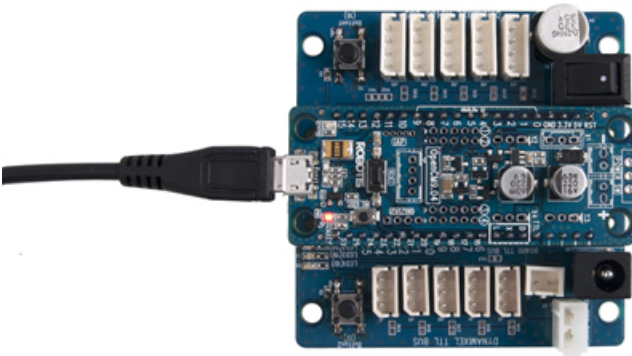
Check orientation as shown in silk



2. OpenCM9.04 is mounted onto OpenCM 485 EXP as shown below.
[CAUTION: The orientation of the connection must be correct.]



3. Connect the USB cable onto OpenCM9.04 board.

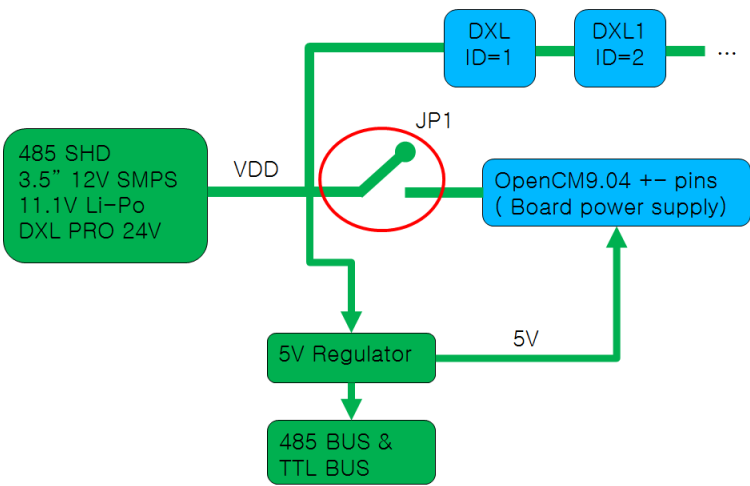


4. Connect Dynamixel and 12V SMPS adapter onto OpenCM 485 EXP board.



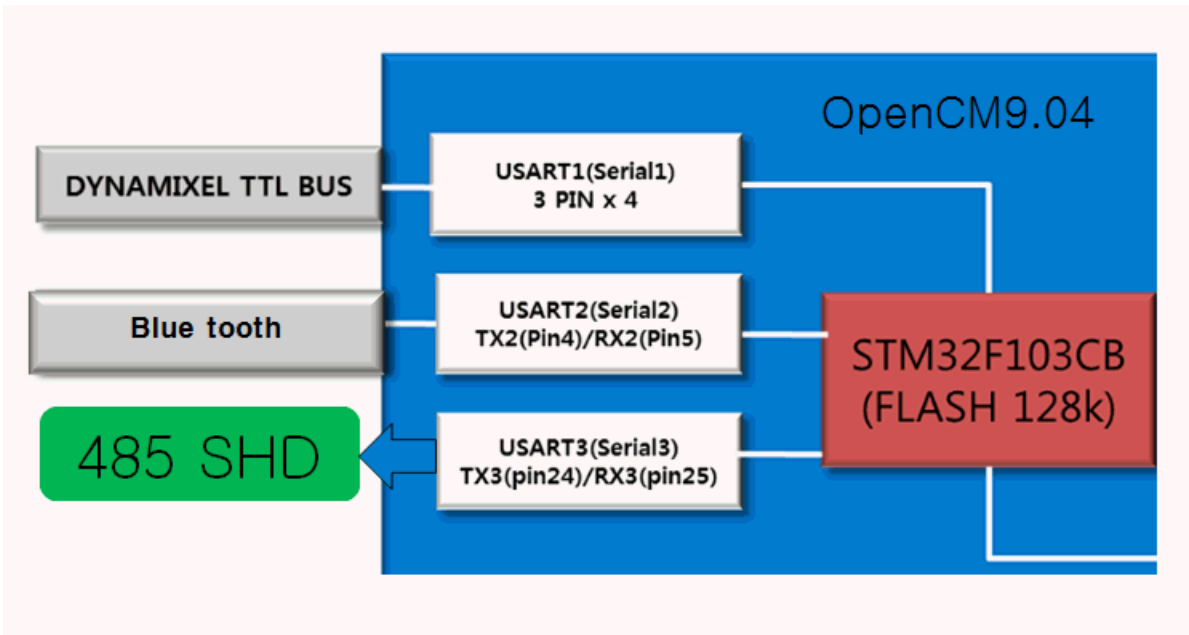
Power Circuit Connection

A power circuit block diagram of the OpenCM 485 EXP and OpenCM9.04, once mounted, is shown below.
 OpenCM 485 EXP supplies 5V from OpenCM9.04 as default. JP1 can be used to determine if VDD power from OpeCM 485 EXP board is supplied to OpenCM9.04.



[OpenCM 485 EXP Power Connection]

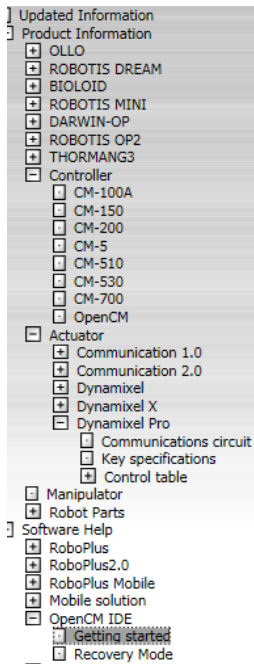
OpenCM 485 EXP’s Dynamixel 485 bus operates as a Dynamixel bus using OpenCM9.04’s USART3(Serial3).
 [NOTE: OpenCM9.04’s Dynamixel TTL BUS is connected to USART1(Serial1).]



[OpenCM9.04 & OpenCM 485 EXP Bus Connections]

OpenCM 485 EXP Board Programming

1. Support.robotis.com -> Software Help -> ROBORIS_OpenCM (MUST use V 1.0.1 or later).



OpenCM IDE

The ROBOTIS OpenCM is a development Software and download tool for the OpenCM9.04 embedded board.

Sources of the ROBOTIS OpenCM are released under licenses of their respective authors

Copyright (c) ROBOTIS Co., Ltd. Modified or newly-created codes are released under the GNUGPL or LGPL licenses.

For more information on the OpenCM9.04 refer to the Appendix section of the e-manuals

[GNU GPL](#)

[GNL LGPL](#)

OpenCM9.04 Software Download

OpenCM9.04 uses the ROBOTIS OpenCM Integrated Developmental Environment (IDE) to allow users to program with ease.

[Windows XP, Vista, 7, 8] 32bit/64bit

[ROBOTIS-v1.0.4-windows.zip](#)

[Mac OS X] Tested in OS X 10.6.8

[ROBOTIS_OpenCM-v1.0.2-macosx.zip](#)

[Linux 64bit] Tested in Ubuntu 12.04

[ROBOTIS_OpenCM-v1.0.2-linux64.tgz](#)

[Linux 32bit] Tested in Ubuntu 10.10

[ROBOTIS_OpenCM-v1.0.2-linux32.tgz](#)

2. Extract OpenCM IDE and execute ROBOTIS_OpenCM.exe file.

drivers	2014-01-07 오전 1...	파일 폴더	
examples	2014-01-07 오전 1...	파일 폴더	
hardware	2014-01-07 오전 1...	파일 폴더	
java	2014-01-07 오전 1...	파일 폴더	
lib	2014-01-07 오전 1...	파일 폴더	
libraries	2014-01-09 오후 7...	파일 폴더	
reference	2014-01-07 오전 1...	파일 폴더	
tools	2014-01-07 오전 1...	파일 폴더	
cygiconv-2.dll	2014-01-07 오전 1...	응용 프로그램 확장	947KB
cygwin1.dll	2014-01-07 오전 1...	응용 프로그램 확장	1,829KB
hs_err_pid5620	2014-01-09 오전 9...	텍스트 문서	21KB
libusb0.dll	2014-01-07 오전 1...	응용 프로그램 확장	43KB
revisions	2014-01-07 오전 1...	텍스트 문서	33KB
ROBOTIS_OpenCM	2014-01-07 오전 1...	응용 프로그램	840KB
rtxSerial.dll	2014-01-07 오전 1...	응용 프로그램 확장	97KB

➔ OpenCM IDE Run

3. OpenCM 485 EXP's 485 Bus sends and receives communication packets from OpenCM9.04's Serial3(USART3).

Dynamixel Class variable MUST be set to 3 once it has been declared.

Dynamixel Dxl(3); //Dynamixel on Serial3 (USART3)

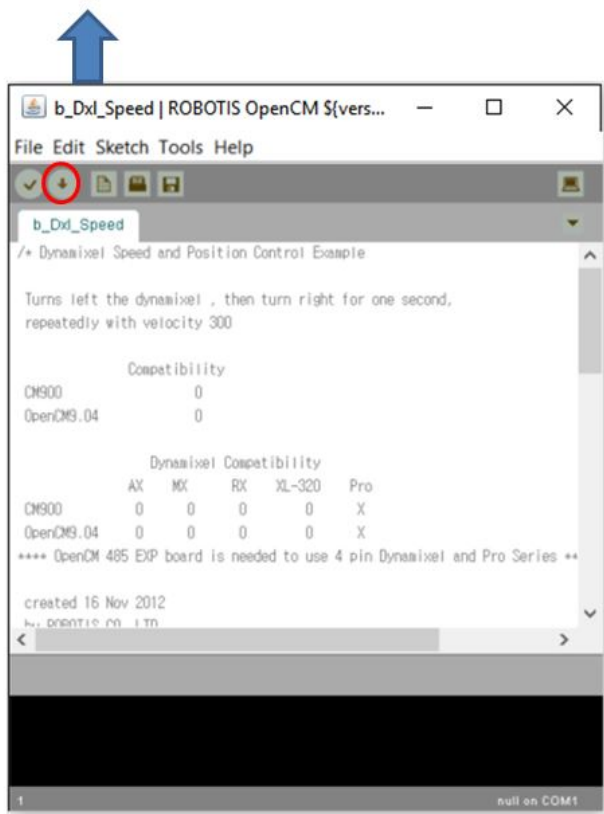
-> Needs to be set as 3 to used USART3 on OpenCM 485 EXP.

```
void setup() {  
  Dxl.begin(1); //1Mbps  
}  
  
void loop() {  
  Dxl.writeWord(6, 30, 0);  
  Dxl.writeWord(2, 30, 0);  
  delay(1000);  
  Dxl.writeWord(6, 30, 1023);  
  Dxl.writeWord(2, 30, 4095);  
  delay(1000);  
}
```

}

4. Click on “Download” button indicated below to download the program.

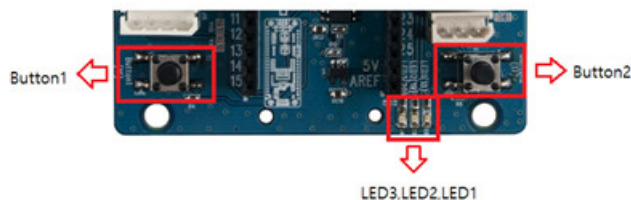
Program Download



OpenCM 485 EXP Button and LED Usage

OpenCM 485 EXP board has 2 buttons and 3 LED's that are connected to OpenCM9.04 I/O pins.
The OpenCM9.04 I/O pin numbers for the buttons and LED's are indicated below.

	OpenCM9.04 I/O
Button1	16
Button2	17
LED1	18
LED2	19
LED3	20



Download Schematics

[DOWNLOAD](#) SCHEMATIC-OpenCM 485 EXP.pdf

Specifications

- Input voltage : 5~30V
- Power : SMPS, LiPo, DXL PRO 24V
- Power Switch: 1

- Dynamixel Port : 4Pin x 5, 3Pin x 5
- Button : 2
- LED : 5
- Size : 68 mm X 66.5 mm
- Weight : 32g